

**DEFECTS AND IMPROVING THE MAINTAINABILITY OF BUILDINGS
AT THE ADVANCE TECHNICAL TRAINING CENTRES**

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OF BUILDINGS AT THE ADVANCE TECHNICAL TRAINING CENTRES

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DEDICATION

To my beloved wife and children for their utmost support, love and inspiration throughout my course of study in the realization of my aspiration to obtain the Master's Degree in Asset and Facilities Management

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ABSTRACT

In the completed or under construction government buildings, there seem to be norms for the occurrence of defects. The only difference between them is how sooner or later it occurs and how bad the condition of it. In recent times, there has been a barrage of defect rapidly occurring on the buildings at the two selected Advance Technical Training Centre which are situated at Taiping, Perak D.R dan Jerantut, Pahang D.M.. The purpose of this research is to look into various factors influencing the occurrence of defects, the type of defects and ways to improve the maintainability of buildings at the Centre. Methodology approach was carried out through evaluating the literature on defects and building pathology, severity of defects in building and on facilities management concept base on quality, value and risk factors on building asset. The research was carried out on a questionnaire-based survey to relevant personnel i.e staffs and occupants at the Centre, all JKR personnel, consultants and contractors who involve in the implementation of the projects at the Centre. The questionnaire was designed to identify the major causes and type of defects on the buildings, the physical condition and common problems encounter on building facilities and services and finally the satisfactory level on the present maintenance management system. The outcome of the study identified shoddy workmanship as main key factors for the defects and low quality finishes for external wall, ventilation and air condition as the common type of defects. On the improvement of the maintainability of the building, strong proposal on quality programs in the local construction industry, increasing training programs for local & foreign workers and improving standard operational procedures were highlighted.

ABSTRAK

Bangunan Kerajaan yang telah siap atau dalam pembinaan kini sering menghadapi masalah kecacatan. Perbezaan antara kecacatan ialah berapa cepat atau berapa lambat ia berlaku dan berapa teruk keadaan nya. Baru-baru ini kebanyakan kecacatan berlaku di dua buah Pusat Latihan Teknologi Tinggi yang terletak di Taiping, Perak D.R dan Jerantut, Pahang D.M yang dikenalpasti. Tujuan kajian ini adalah untuk mengenalpasti faktor yang mempengaruhi terjadinya kecacatan, jenis-jenis cacat dan cara-cara untuk meningkatkan penyelenggaraan bangunan di Pusat –Pusat itu. Metodologi pendekatan dilakukan melalui penilaian terhadap literatur tentang kecacatan dan patologi bangunan, tahap keparahan kecacatan serta keatas pengurusan fasiliti berdasarkan konsep kualiti , nilai dan faktor risiko yang terlibat dalam aset bangunan. Kajian dilakukan melalui borang soal selidik kepada orang- orang yang berkaitan iaitu kakitangan dan penghuni di Pusat, semua pegawai JKR, perunding dan kontraktor yang terlibat dalam pelaksanaan projek di Pusat-Pusat itu. Borang soal selidik direka untuk mengenal pasti punca utama dan jenis kecacatan dalam bangunan, masalah senggaraan yang sedang dihadapi dan tahap kepuasan pada sistem pengurusan penyelenggaraan. Keputusan kajian mengenalpasti perlaksanaan kerja yang kurang baik sebagai faktor utama berlaku kecacatan,.Permukaan dinding luaran berkualiti rendah dan keadaan ventilasi udara kurang baik sebagai kecacatan yang sering berlaku. Cadangan bagi peningkatan penyelenggaraan bangunan melalui soal selidik adalah program peningkatan dalam industri pembinaan tempatan, meningkatkan program latihan bagi para pekerja tempatan & asing dan meningkatkan prosedur operasi standard

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LIST OF ABBREVIATIONS

FM	-	Facilities Management
JKR	-	Jabatan Kera Raya
ADTEC	-	Advance Technical training Centre

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CHAPTER 1

INTRODUCTION

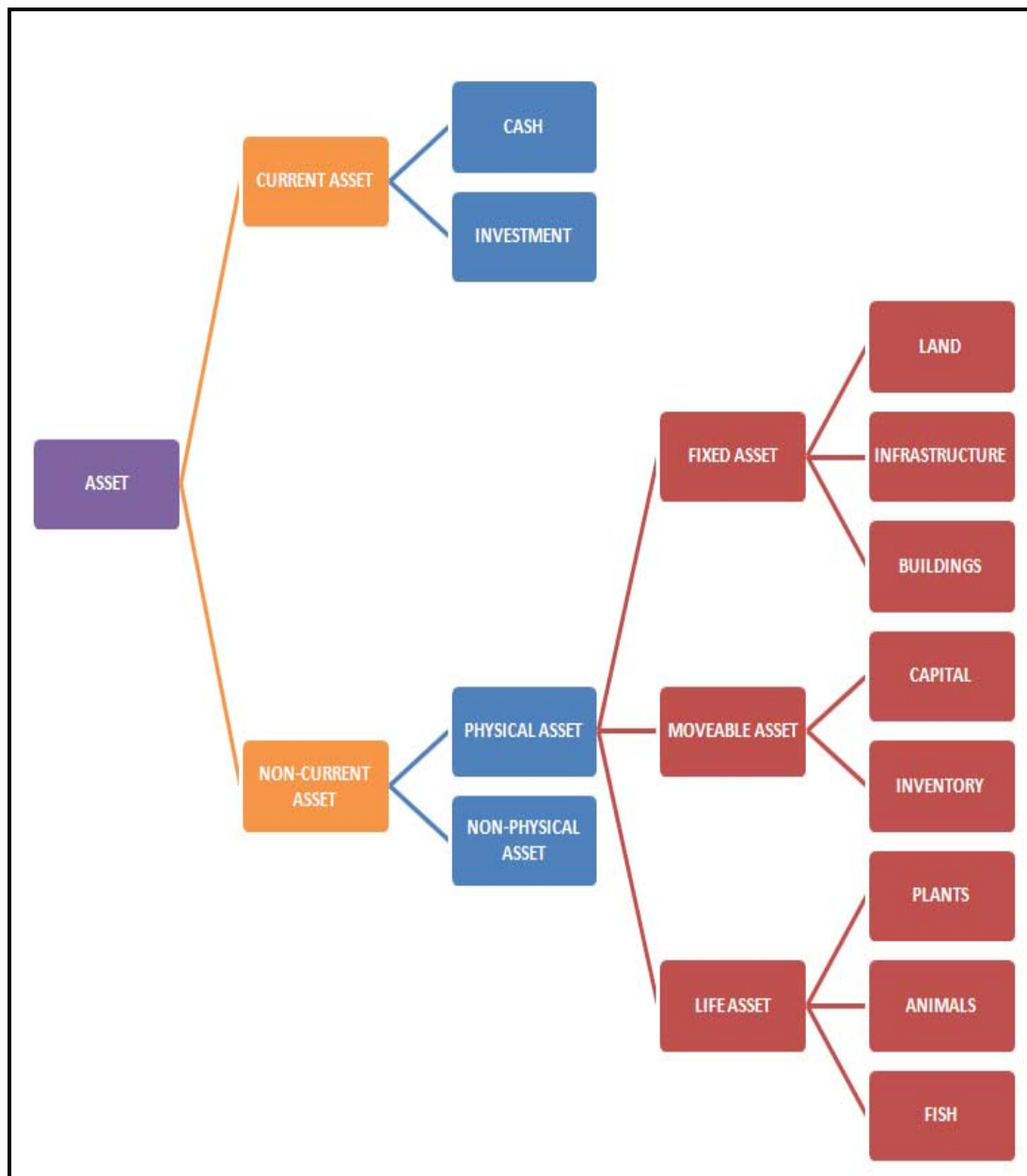
1.1 Background of Research

Facilities Management (FM) is an important component in government initiated buildings. FM in Malaysia is relatively new and gaining recognition. A statement by the former Prime Minister of Malaysia who said this, “ Unless Malaysians change their mentality to become more aware of the need to provide good services and improve the upkeep of buildings, we will forever be a Third World Country with First World infrastructure” (Badawi, 2001) has stressed the importance of FM in the Malaysia context.

Many researches emphasis FM as a support function (UCL, 1993; Alexander, 1996) to the organization, but its role in the maintenance of building facilities and in property management are also critical and demanding (Sarshar, 2000; Underwood and Alshawi, 2000; Barrett, 1995). FM represents a field of activity beyond the design, procurement and furnishing of buildings that continues into the realm of management skills associated with the use of a facility, and how that facility evolves and develops in response to the changing demands of the occupier (Park, 1998).

In Malaysia, JKR as technical department is no longer just a government implementer but also the keeper of the value and the timeliness of the projects, its main aim to fulfill the clients’ criteria and needs. In line with the directive of the former Prime Minister Tun Abdullah Bin Ahmad Badawi, JKR has undertaken the duty and task of the facility management system to safeguard the assets of the nation

(as in figure 1) which are valuable and worth having. The nation's assets which mainly handle by JKR are (as per table 1) In order to attain the goal and aim, the organization move forward with new strategic concept on maintenance management of assets. It base on value for money, minimizing the risk and environmental impact, ensuring full use of diminishing assets and dispose of it when it is necessary and a healthy workplace for its staffs.



Source: Government Asset Management Manual, 2009

Figure 1.1 Classification of asset

Table 1.1 Nation's asset handles by JKR

Asset	Type of Asset
a) Infrastructures	Roads, bridges and access, airport runway, ports & jetties, water supply & treatment system, sewerage & treatment system and quarries
b) Buildings	Structures and its buildings, civil facility system, mechanical component system, electrical component system and building facility system
c) Non-Asset	Vehicles, machinery, electric, electronic & ICT

Source: Government Asset Management Manual, 2009

1.2 Problem Statement

In the completed government buildings, there seem to be norms for the occurrence of defects. The only difference between them is how sooner or later it occurs and how bad the condition of it. In recent times, there has been a barrage of defect rapidly occurring on the buildings at the two selected Advance Technical Training Centre. There are many factors influencing the occurrence of defects and leads to many problems. These delays the daily functionality of the organization, causes extra cost for repairs to the clients, extra workload, paperwork and monitoring process by JKR personnel and finally lead to complaint from all level of government servants.

In general, the aspects of maintenance criteria were not taken into consideration during pre and post construction stage. Aspects like type and the right quality of materials used, method statement not well specified, shoddy workmanship,

lack of monitoring and inspection, lack of quality control, lack of proper maintenance practices, information and record auditing and etc. In consequences, there arises a lot of problem due to defects where nothing much of changes can be done on the casted structures, types and quality of materials used and finally the method of construction carried out. This increased the level of concern over condition of the buildings at the two (2) selected Advance Technical Training Centre by top management and looked for a concrete maintenance management system.

Other problem is the lack of facility maintenance management (FMM) knowledge among JKR personnel, clients and contractors. Those parties involves also do not have clear understandings of FMM approach to steer through our contractual responsibilities. The buildings we maintain must serve our needs for many years ahead, as well efficient in usage of materials, manpower and cost. Thus it time for JKR to switch to more sustainable and environmentally acceptable maintenance system to the technical training centre.

1.3 Objective of Research

The main objective of the research is to conduct an investigation on defects at the two (2) Advance Technical Training Centre especially:

- a) To identify the various types and the causes of defects.
- b) To incorporate maintenance management system for an effective maintenance of the buildings

1.4 Scope of Research

The scope of research is to focus on two (2) selected government Advance Technical Training Centre i.e.:

- a) Advance Technical Training Centre, Taiping, Perak Darul Ridzuan.
- b) Advance Technical Training Centre, Jerantut, Pahang Darul Makmur

The two (2) centre comprise similar components i.e. administrative block, academic (workshops) blocks, hostels, multi-purposed hall, auditorium, surau, cafeteria, dining hall and staff quarters and infrastructures.

1.5 Importance of Research

To improve the organization current practice of managing maintenance by developing the followings:-

- a) Develop a maintenance strategy and a program of regular condition assessment for building performance and reporting system.
- b) Identify and replace obsolete design and construction system, method statement, specification, monitoring and inspection system.
- c) To create a system of competent trained staffs to match the right people for the right job for excellence performance in maintenance management.

1.6 Research Methodology

The research methodology will be carried out as per chart 1 which goes through process of preliminary studies, primary data collection, secondary data collection, data analysis and its outcome and finally conclusion and recommendation.

1.6.1 Preliminary Study

At these stage journals, books, bulletin and from reliable internal sources will refer to solve the problem statement.

1.6.2 Primary Data Collection

Primary data collection will focus on information gathered from the office of JKR and client's ministry.

1.6.3 Secondary Data Collection

At this stage the data collection is conducted on questionnaire and interview to the following personnel.

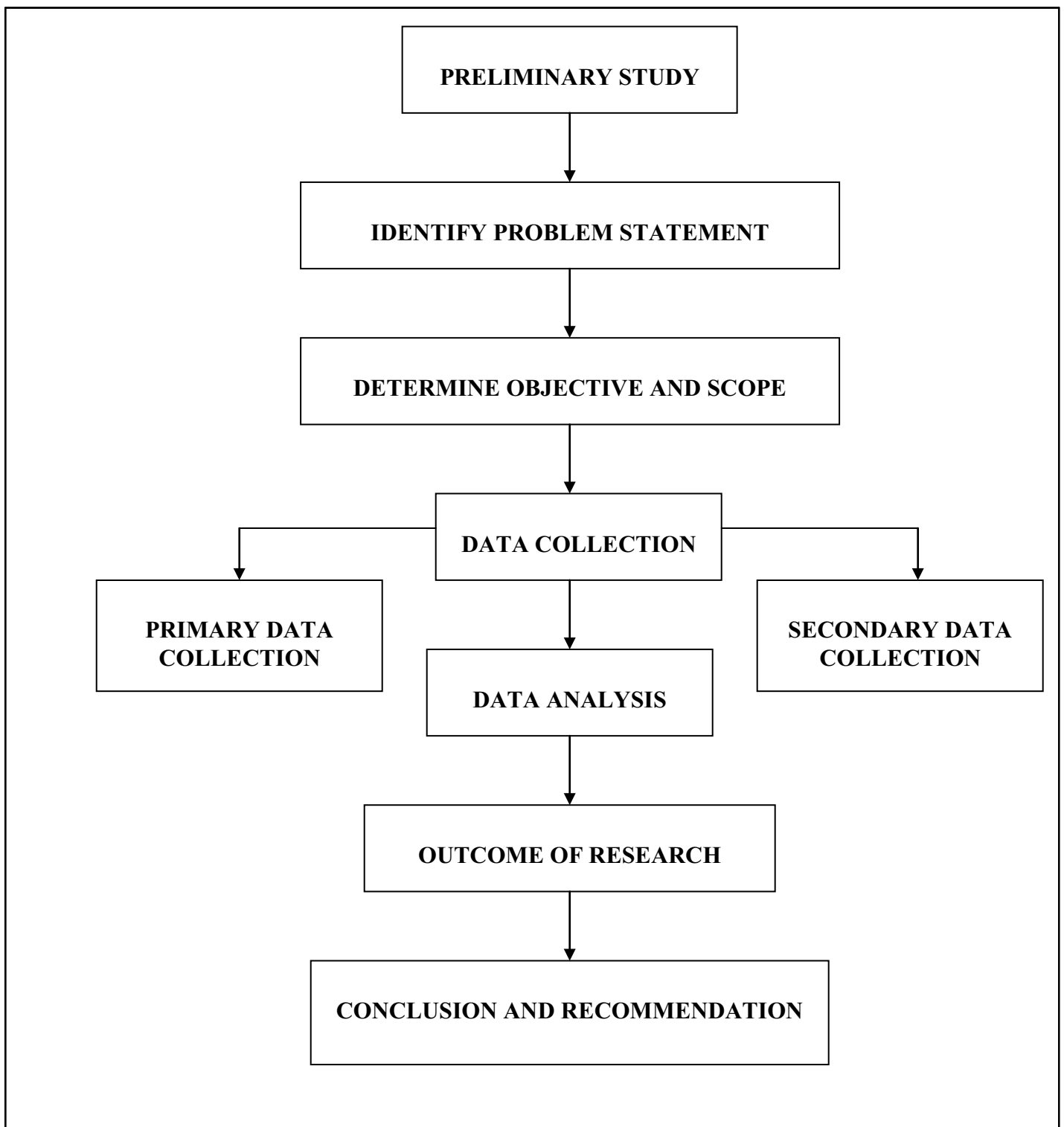
- a) Staffs and top management of Public Works Department
- b) Clients - Ministry of Human Resources
- c) Contractors and consultants
- d) User / Occupants of the building

1.6.4 Data Analysis

The collected data will be analyses by quantitative and qualitative method so as to finalize and achieve the research objectives.

1.6.5 Conclusion And Recommendation

The review of the current state of application of maintenance procedures and maintenance contractual requirements i.e. specifications and drawings, method of construction, materials utilized and the quality of workmanship to be carried out for improvement of root causes of defects on the buildings with the adoption of maintenance strategy and condition assessment standards would definitely steer the client with safe, healthy and sustainable environment and lasting asset value of the buildings.



Source: Researcher, 2010

Figure 1.2 Research Methodology flow chart